

REMARKS/ARGUMENTS

Claims 1-13, 15-19, 22-35, 37, 38 and 42-51 (new) remain in the application.

Claims 20-21 and 39-41 have been withdrawn from consideration as directed to a non-elected species.

Claims 14 and 36 have been canceled because they are duplicative.

Claims 1-13, 15-19, 22-35 and 37 stand rejected; claim 38 has been objected to and indicated as allowable subject to being written in independent form. It has been amended to stand alone as an independent claim.

Claims 42-50 stand allowed.

Overview

The clearly distinguishing characteristic of Applicant's invention over all of the cited prior art is that Applicant exploits the concept of motion parallax to create a dynamic 3-D image. Applicant has not found a single reference to motion parallax in any of the many cited prior art references, including those patents relied on to support claim rejections.

To the extent that any of the cited references teach methods and/or apparatus for creating a perceivable 3-D image, they all result in a static 3-D image and, in some cases, an ersatz 3-D image which is really only shadowing.

While one or more of the cited references teach the use of carriers by which different masks and other screens and devices can be disposed at the objective aperture of a lens in a microscope system, none of the cited references

suggest that the carrier be moved continuously while the specimen is being observed, but rather teach that the carrier be moved into the area of the objective aperture and remain there in a static state while the specimen is viewed. The only suggestion for continuous rotation of such carriers comes from the Examiner—not the prior art.

By contrast, Applicant teaches the imposition of a mask at the objective aperture, which mask limits the area of the aperture through which light passes to only a portion of the aperture and then, during viewing, continuously rotates the portion of the aperture through which light passes about the axis of the aperture to create motion parallax which presents to the viewer a dynamic 3-D image.

The mask that limits the area of the objective aperture that passes light and continuously changes is a single mask, as opposed to multiple masks, as taught by the prior art.

Applicant has made amendments to some of the claims to emphasize the distinguishing features pointed out above which were clearly implicit in the original claims.

Claim Rejection - 35 USC § 102 Piller et al. (US Patent 4,407,569)

Applicant respectfully traverses the Examiner's rejection under 35 U.S.C. 102(b) of claims 7 and 16 on the basis of Piller et al. (US Patent 4,407,569).

Nothing in Piller suggests the creation of motion parallax as a means for achieving a 3-D image.

Piller suggests the use of a diaphragm with a ring segment to create a

shadow which produces “a relief effect.” It is clear from the context and teachings of Piller that the observer views the specimen while the diaphragm is in a static state. Although the diaphragm can be rotated in order to change the angle at which the light approaches the specimen, it is clear that the rotation is transitory and not continuous during viewing. What Piller fails to teach is the continuous rotation of the diaphragm ring to create motion parallax.

Claim 7 has been amended to include

means for continuously rotating the mask through multiple rotations, which causes the portion of the objective aperture that passes light to continuously rotate about the objective aperture axis and thereby continuously change the angle of illumination and thereby create motion parallax.

Piller does not teach or suggest means for continuously rotating the mask. In fact, it would not be productive for Piller’s purpose to rotate the ring more than once. While the Piller mask can be rotated to change the angle of shadowing, it is clear to those skilled in the art that the mask is intended to remain static during observation of the object. As a result, Piller does not provide a means for continuously rotating the mask. Every advantage of Piller is derived during a single rotation of the mask. Piller teaches that the dependence of the shadowing effect on azimuth can be investigated by turning the ring. (Col 3, line 36-37.) After one full rotation, the effect simply duplicates previous azimuth positions and thus would produce nothing new.

Piller’s shadowing produces, at best, an ersatz 3-D view. Applicant’s invention produces a real 3-D view by providing means not found in Piller for

creating motion parallax. To create the motion parallax, the aperture mask must be continuously rotated while the object is being viewed. This requires a mechanism not found in Piller because Piller has no need for such a mechanism.

While Applicant submits that it is proper to use terms in the claims that are defined in the specification with the understanding that the definitions will be used in interpreting the claims, Applicant has nonetheless brought the definition of “dynamic aperture mask” into the claim to avoid any argument.

Since the limitations of the definition of “dynamic aperture mask” were not previously considered, they must be now. Because these limitations distinguish Applicant’s invention over Piller, claim 7 should now be allowed.

Claim 16 having all the limitations of claim 7 is likewise allowable.

Claim Rejection - 35 USC § 102 Greenberg (US Patent 5,706,128)

Applicant respectfully traverses the Examiner’s rejection under 35 U.S.C. 102(b) of claims 7 and 13-19 on the basis of Greenberg.

Greenberg, with which Applicant is familiar, teaches a carrier having a plurality of various screens that can be aligned with the objective aperture of an objective lens.

The various screens illustrated in Fig. 3 include not only apertures, but filters and other devices.

The assertion that the rotation of the carrier 27 about its axis 28 is the equivalent of Applicant’s claimed invention cannot withstand scrutiny.

There is nothing in Greenberg that suggests that the carrier 27 be rotated

other than as necessary to position one of the screens on the carrier to the objective aperture. While some of the carrier screens provide 3-D viewing, in no case is the 3-D effect a result of motion parallax. In fact, nothing mentioned in Greenberg even suggests, let alone teaches, the use of motion parallax to obtain a 3-D effect. One of the advantages of motion parallax is that it does not require special glasses or polarizing filters.

Claim 7 has been amended to incorporate the definition of “dynamic aperture mask” which was in the original claim by virtue of the rule that a claim term will be read to include any definition given in the specification. To satisfy the Examiner, the definition has now been incorporated into the claim *pro hac verba*.

The novel suggestion by the Examiner (it certainly is not suggested in Greenberg) that the carrier 27 be rotated to achieve motion parallax simply will not work. The amended claim calls for the light to pass continuously through the mask, which would not be the case should the carrier 27 be rotated.

Also there simply is no means to, and no need for, a drive to continuously rotate the mask through multiple rotations while the object is being viewed.

For all of the reasons given above, claim 7 and its dependent claims 13 and 15-16 are allowable.

Claims 17-19 include all of the limitations of claim 7 in addition to others. Once again, the definition of “dynamic aperture mask” has been imported directly into the claim. All of the arguments given above with regard

to claim 7 apply with equal force to claim 17 and its dependent claims 18 and 19. Thus, they, too, are allowable.

Claim Rejection - § 102 Bauerschmidt (German reference 34 09 657)

Applicant respectfully traverses the Examiner's rejection under 35 U.S.C. 102(b) of claims 7, 10-11 and 13-15 on the basis of Bauerschmidt.

Bauerschmidt (Fig. 2) teaches a mask formed by two overlapping aperture-forming elements 14 and 15 that can be positioned relative to each other to create different opposing pair apertures. Levers 16 and 17 are used to position the aperture-forming elements 14 and 15.

Like the other cited art, Bauerschmidt contemplates a static mask during viewing and neither suggests nor provides the mechanisms necessary to continuously rotate the masks to produce motion parallax.

The definition of "dynamic aperture mask" has been imported directly into claim 7, and, since it was not so considered before, there should be no doubt that claim 7 and its dependant claims 10-11 and 13-15 now distinguish over Bauerschmidt.

Claim Rejection - 35 USC § 102 Kley (US Patent 4,561,731)

Applicant respectfully traverses the Examiner's rejection under 35 U.S.C. 102(b) of claims 1-8 and 12-16, on the basis of Kley.

While Kley may disclose a sector-shaped aperture formed by liquid crystal cells, nothing in Kley suggests that the sector-shaped aperture be rotated to continuously change the portion of the objective aperture through which light passes to create a continuously changing angle of view which produces motion

parallax that gives rise to 3-D viewing.

Claims 1 and 7 include limitations far beyond a sector-shaped mask at the aperture plane and the rejection does not even attempt to point out where Kley discloses those other limitations—which it does not.

Kley is an insufficient basis for a valid 102 rejection. Claims 1-8 and 12-16 are clearly allowable over Kley.

Claim Rejection - 35 § 103 Bauerschmidt (German reference 34 09 657)

The rejection of claim 9 under 35 U.S.C. 103(a) as being unpatentable over Bauerschmidt is respectfully traversed. As demonstrated above, claim 7, from which claim 9 is dependent, is allowable over Bauerschmidt and, thus, the more restrictive dependent claim 9 is also allowable.

Claim Rejection - 35 USC § 103 Kley (US Patent 4,561,731)

Applicant respectfully traverses the Examiner's rejection of claims 22-24 and 26-37 as being unpatentable over Kley under 35 U.S.C. 103(a).

The Examiner appears to acknowledge that the only relevant teaching of Kley is the establishment of a sector-shaped mask using electronically controlled liquid crystals. Without some suggestion by Kley or some other prior art reference that the mask aperture be rotated to create motion parallax, the rejection is nothing more than a recognition that the prior art teaches the starting point of Applicant's invention and one who is exposed to Applicant's invention would be able to modify Kley to produce Applicant's results. That is not a proper or legal basis for a 103 rejection.

Applicant respectfully submits that the rejection is improper in that the

Examiner's conclusion that an observer would be able to design a method for viewing an image of an object in three-dimensional aspect by setting forth the step of continually rotating the diaphragm is without support and merely illustrates that the Examiner has been exposed to Applicant's invention.

The allegation by the Examiner that Kley could be modified in some way to achieve Applicant's invention is not the proper basis for a 103(a) rejection as clearly set forth in Ex Parte Levengood, 28 USPQ 2d 1300, 1301-1302 (TTAB 1993) wherein the Board stated:

In this case, however, the only suggestion of the isolated teachings of the applied reference improperly stems from the Applicant's disclosure and not from the applied prior art. In In Re Ehrreich, 590 F.2d 902, 200 USPQ 504 (CCPA 1979), at best, the Examiner's comments regarding obviousness amount to assertion that one of ordinary skill in the relevant art would have been able to arrive at Applicant's invention because he had the necessary skills to carry out the requisite steps. This is an inappropriate standard for obviousness. See Orthokinetics, Inc. v. Safe Travel Chairs, Inc., 806 F.2d 1565 1 USPQ 2d 1801 (Fed. Cir. 1986). That which is within the capabilities of one skilled in the art is not synonymous with obviousness. [Citations omitted]. That one can *reconstruct* and/or explain the theoretical mechanism of an invention by means of logic, sound or scientific reasoning does not afford the basis for an obviousness conclusion unless that logic and reasoning also supplies sufficient impetus to have led one of ordinary skill in the art to combine the teachings of reference with the claimed invention.

The suggestion for continuously rotating the mask while the specimen is being viewed in order to create motion parallax is nowhere suggested or even hinted at in Kley. To modify Kley by providing means that would continuously rotate the mask while the specimen is being viewed in order to create motion parallax is only proper if the suggestion for doing so comes from the prior art. No such suggestion in the prior art has been pointed to by the Examiner.

Claim Rejection - 35 USC § 103 Fujihara et al (US Patent 4,852,985) in View of Kley (US Patent 4,561,731)

Applicant respectfully traverses the Examiner's rejection of claims 22-23, 26-27 and 32 under 35 U.S.C. 103(a) on the basis of Fujihara in view of Kley.

Once again, the Examiner has had to fill in the missing steps from Applicant's disclosure after finding no support in the cited references. Applicant's invention centers on continuously changing the angle of view while viewing the object so that motion parallax will be produced, which, in turn, will allow real time viewing in 3-D without filters or special glasses. Such phrases as "motion parallax" and "continuous rotation of the mask" are not found in the cited art. That parts or steps of Applicant's invention may be found in various parts of the prior art and could be assembled to approximate Applicant's invention is not a proper 103 rejection. Absent Applicant's disclosure, where is the prior art suggestion to put together the steps of Applicant's method? Where in the prior art is motion parallax even thought about?

On this point, the law is crystal clear as set forth in In re Fine, 5 USPQ2d 1596 (CAFC 1988):

. . .The PTO has the burden under section 103 to establish a *prima facie* case of obviousness. It can satisfy this burden only by showing some objective teaching in the prior art or that knowledge generally available to one of ordinary skill in the art would lead that individual to combine the relevant teachings of the references. In re Fine, at page 1598. (Emphasis added)

The Board reiterated the Examiner's bald assertion that "substitution of one type of detector for another in the system of Eads would have been within the skill of the art," but neither of them offered any support for or explanation of this conclusion. In

re Fine,⁹ at page 1599. (Emphasis added)

The Eads and Warnick references disclose, at most, that one skilled in the art might find it obvious to try the claimed invention. But whether a particular combination might be “obvious to try” is not a legitimate test of patentability. In re Fine, at page 1599.

Instead, the Examiner relies on hindsight in reaching his obviousness determination. . . . To imbue one of ordinary skill in the art with knowledge of the invention in suit, when no prior art reference or references of record convey or suggest that knowledge, is to fall victim to the insidious effect of a hindsight syndrome wherein that which only the inventor taught is used against its teacher. In re Fine, at pages 1599-1600.

One cannot use hindsight reconstruction to pick and choose among isolated disclosures in the prior art to deprecate the claimed invention. In re Fine, at page 1600.

Following the legal standards by which the PTO is bound in the matter of combining references, claims 22-24 and 26-37 are allowable over Fujihara in view of Kley.

New claim 51 has been added to more fully protect Applicant's invention. The combination of an aperture mask with an off access aperture and a motor for rotating the mask is not found in any of the prior art cited to date and no suggestion for such a motor-driven mask to produce motion parallax and 3-D viewing is found in the prior art. Thus, claim 51 is allowable over the cited art.

ALLOWABLE SUBJECT MATTER

Applicant notes with appreciation the allowance of claims 42-50.

Claim 38 has been rewritten in independent form and, based on prior indications, is therefore allowable.

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CONCLUSION

Applicant has amended the rejected independent claims which remain in the application to more explicitly point out the features of Applicant's invention which were implicit as originally submitted and which distinguish over the prior art.

Applicant's invention resides in disposing a dynamic aperture mask at the aperture of a light microscope in order to (a) limit the area of the aperture through which a light beam passes to an off axis area less than the entire area of the objective aperture and (b) to continuously rotate the area of the objective aperture through which the light beam passes for multiple revolutions in order to continuously change the angle of illumination of the specimen being viewed so as to create motion parallax, enabling the viewer to see a dynamic 3-D image.

Nothing in the prior art remotely suggests the creation of motion parallax as a means for producing a 3-D image. While the Examiner has located certain elements of Applicant's invention in various patents in the prior art, the particular combination claimed by Applicant is nowhere to be found in the prior art, and the various combinations of prior art elements suggested by the Examiner as amounting to Applicant's invention are improper as not being suggested by the prior art, but rather only by Applicant.

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Accordingly, Applicant respectfully requests that the various objections and rejections to the claims specified above be withdrawn and the claims remaining in the case be deemed allowable.

If any additional payment of fees is required, please charge Patent Office Deposit Account 02-4375.

Respectfully submitted,

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